

HERPETOLOGICAL NOTES FROM THE NEVADA TEST SITE

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ABSTRACT.— During the years 1965–1971, considerable data were gathered that included information concerning species not previously reported. These included *Chionactis occipitalis talpina*, *Coleonyx variegatus utahensis*, *Crotaphytus collaris bicinctores*, *Cnemidophorus tigris tigris*, and *Sauromalus obesus obesus*. Although complete information concerning their life histories is not reported, some information concerning growth and reproduction is included.

The following notes were made by Mr. Ronald L. Morris, Dr. John E. Krogh, or the author and represent our findings concerning species found in our NTS study plots not reported previously. Several of our study plots provided some data on species that were not intensively studied or the limited data did not seemingly justify, at that time, consideration. It was our intent to gather additional data; however, this was not possible, and I am, therefore, presenting those data which are considered to have value.

Study plots were originally established for the express purpose of examining in as much detail as possible the life histories and habitats of the more abundant species. Thus, Rainier Mesa provided data on *Sceloporus occidentalis* and *Uta stansburiana* (Tanner and Hopkin 1972, Tanner 1972). Three study plots in Frenchman Flat examined *Crotaphytus wislizeni* (Tanner and Krogh 1974), *Phrynosoma platyrhinos* (Tanner and Krogh 1973), and *Callisaurus draconoides* (Tanner and Krogh 1975). Data from the Mercury Valley plot were included in some of the reports listed above.

In three of the five study plots, can pitfall traps were used; this enabled us to at least sample most of the species, particularly small lizards and snakes, that occurred in the habitat being studied. In the other two plots lizards were caught and marked by means of a noose.

At the Frenchman Flat Plot 2 (a rocky hill completely surrounded by desert flats and situated west of the Mercury highway and south of the Kane Springs road), small popu-

lations of *Crotaphytus collaris* and *Sauromalus obesus* were studied. At the Mercury Valley plot some data were obtained for *Coleonyx variegatus* and *Chionactis occipitalis*. Although only fragmentary data are presented, it does seemingly have merit.

Chionactis occipitalis talpina Klauber

We marked 62 individuals; of these 5 were recaptured once, and one twice. All recaptures were within 40 to 180 feet of the original capture, and 4 were recaptured two years after the original capture. Although these data do not substantiate a home range, they do indicate a relatively small "homing" area for this species. The can traps were set 40 feet apart in rows of 10 traps, and in rows numbered from A to T. Number 16, a young adult (S-V 225 mm), moved from G-8 (15 June 1966) to F-3 (5 August 1967) and to C-5 (5 June 1968).

The smallest individual marked was a hatchling marked 28 August 1969 with a S-V of 109 mm. The largest female was 291 mm S-V and the largest male was 287 mm. Individuals were considered adults if they were 250 or more in S-V length. Weight of adults varied with size and, in females, before eggs were laid. In adults, weights ranged from 6 to 10.4 grams.

Growth

Three of those recaptured were juveniles or subadults and show the following growth:

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No. 7 marked 15 August 1965 S-V 215 mm. Recaptured 5 June 1967 S-V 236 mm growth, 21 mm in 21½ months.

No. 12 marked 3 June 1966 S-V 239 mm. Recaptured 5 June 1968 S-V 251 mm growth, 12 mm in 24 months.

No. 16 marked 15 June 1966 S-V 225 mm. Recaptured 5 August 1967 S-V 250 mm. Recaptured 5 June 1968 S-V 251 mm growth, 25 mm in 13½ months.

Growth after individuals attain 250 mm in S-V length is seemingly slowed to a few mm per season, or, as in number 16, growth of no more than 1 mm in 24 months. Our data indicate that subadults may grow 0.5 to 2 mm per month, and show that from hatching to the largest adults they provide a S-V growth of approximately 180 mm. We do not have any data on longevity.

Coleonyx variegatus utahensis Klauber

At the Mercury Valley study plot we marked 115 individuals, and of these 33 were recaptured; 23 once, 7 twice, 2 three, and one five times. These data do not provide sufficient information to establish with certainty a home range size for this species. We conclude this in spite of the fact that many individuals were recaptured not far from their original capture, but only a few were recaptured more than twice. Those recaptured three or more times during two or more years do indicate a relatively small home range.

Females were gravid during July and early August in 1965. Hatchlings were seen in August. The earliest seen by us was 10 August 1966. Hatchlings during August (10th to 30th) from 1965-1969 range in size from 32 to 40 mm. It is assumed that the larger hatchlings seen in late August had been extant for several weeks, thus accounting for their larger size. Twelve juveniles caught in June (5th to 29th) ranged in size from 45 to 58 mm. Growth of hatchlings continues into September and begins again in April or early May; this accounts for the 10 to 15 mm of added growth seen in June.

Growth continues so that by August most juveniles have reached a S-V length of at least 60 mm, and by the next June are between 65 to 70 mm, most nearing 70 mm.

The largest female individual seen measured 73 mm in S-V, was gravid, and weighed 6 grams on 1 August 1965.

Crotaphytus collaris bicinctores

Smith & Tanner

Great Basin Collared Lizard

Five adults were marked in 1965-1966 at the Frenchman Flat Plot 2. Each of these were recaptured or observed many times until the plot was closed in 1971. The habitat is a rocky ridge approximately 500 yards long and about half as wide. It rises to a peak in the middle and was used during the open air atomic testings as an observation point. On its top was a pole, which we refer to as the flag pole. Because of the openness of the habitat, the lizards moved over large areas within a loosely considered home range; this was quite in contrast to the limited space available to lizards in the study by Fitch (1956). Number 5 was observed during five years and traversed the southeastern side of the ridge, a linear distance of 680 feet. Although the others were not observed to travel this far, the home ranges, if indeed such occur, were large. There was an overlapping of ranges, even by males, a condition perhaps related to the openness of the large range and the small number of individuals present. We assumed the small population to be related to the food supply. We did not see many insects, and a population of *Sceloporus majester* shared the habitat and the food.

The lizards were easily spotted on rocks, usually on those higher than others nearby. They were not easily frightened, so we could observe them at close range. On 9 June 1966 we observed number 2, an adult male, vigorously active around a large rock near the flag pole (F-10). As we approached the rock, we noted a swarm of flying ants around the rock, and as the ants fluttered and tumbled over and down the rock, they were eaten by the lizard. At times he would feed on four to six ants in rapid succession, when they were available at the base of the rock. He would jump to capture flying ants if others were not available on the ground. He was relatively tame and paid little attention to us, even though we were only a few feet away.

On 1 July 1966, number 1, an adult female, was recaptured at G-6; on being released she moved up the ridge to F-10 and soon thereafter was observed eating flying ants that were still swarming on a rock near the flag pole.

The basking lizards were seen to leave their rock perch and chase a short distance, and then return. Number 5, an adult female, was observed on a rock near H-11 (about 100 feet from the flag pole); after observing for some time, we threw small rocks near her, and each time she responded by rushing to the spot where the rock lit. We were about 40 feet away, and by continuing to throw pebbles we were able to draw her right up to us. Each time after chasing a rock she would perch on a nearby rock and watch. Our observations of feeding activities compare similarly to those of Fitch (1956), and indicate a series of similar activity and feeding behaviors.

We did not see hatchlings at this plot, although each of the females was observed to be gravid on 29 June 1966. Growth was observed in three, with numbers 2 and 3 (who were 103 and 89 mm in S-V length) showing no growth. Number 5 was 79 mm in S-V on 12 June 1966, and had grown to 95 mm on 15 May 1971. Weight during this same period increased from 21 to 28.8 grams; only gravid females weighed more (number 3 on 12 June 1966 weighed 33 grams).

Although we do not have data for complete growth and longevity, we do recognize this species as one with perhaps as long or longer life span than other lizards at this plot, except for *Sauromalus*. By comparing the size of number 5 (79 mm) to specimens in our preserved collection, we were not able to determine if she was nearing one or two years. Her size would represent only one year if based on data for the eastern subspecies (Fitch 1956). The study by Fitch shows rapid growth, with some individuals reaching full adult size in one year, an indication of abundant food and perhaps more favorable climatic conditions. The desert foothills and valleys of the Frenchman Flat area (Tanner and Hopkin 1972, Fig. 4) are dry and hot for most of June through September, with only an occasional thunderstorm. This not only affects the activities of the lizards, but also

seemingly dries up the vegetation and may reduce the availability of insect food. In spite of the fact that the two studies are of two widely separated, distinct subspecies, we believe that environmental factors are extremely important in providing the differences in growth rate. When last seen, number 5 (15 May 1971) was in apparent good health and was either in her sixth or seventh year.

Cnemidophorus tigris tigris Baird & Girard
Great Basin Whiptail

Our field data concerning reproduction, growth, and longevity confirm previous studies such as those of Tanner and Jorgenson (1963), McCoy and Hoddenbach (1966), Burkholder and Walter (1973), and Turner, Medica, Lannom, and Hoddenbach (1969). The study by Tanner and Jorgenson (1963) suggested that aestivation, or early hibernation, occurs in early summer. We have observed this during a five-year study of populations at our study plots in Frenchman Flat and Mercury Valley. At both plots there was a noticeable reduction in the number of adults seen beginning in mid-July; the last adults were seen occasionally until mid-August. The latest record we have of an adult (92 mm S-V) was 26 August 1965. During August, hatchlings and second-year juveniles are seen, but by September only the year's hatchlings, ranging in size from 40 to 55 mm in S-V length, are seen. This does not mean that an occasional adult may not be seen, but our record indicates that a decided reduction in activity occurs each year beginning in mid-July. By far the greatest activity is in May and June.

We also noted that adult individuals marked in June or July, and then recaptured in April or May (soon after becoming active the next year), invariably had lost several grams of weight. Examples are toe-mark number 2-4, 8 June 1967, S-V 91, weight 24.8 grams; recaptured 7 April 1968, S-V 88, weight 20.8 grams. This individual was seen again on 4 May 1968 with a S-V of 93 and 23.1 grams. Number 1-6 marked 7 June 1966, S-V 99, weight 26 grams, recaptured 7 April 1968, S-V 96, weight 25 grams. Our data suggest that the early hibernation has the effect

of reducing size and weight, which is rapidly regained by adults in June.

Sauromalus obesus obesus Baird
Western Chuckwalla

A population of chuckwallas were seen in Mercury Pass as we traveled from Mercury to our study plots in Frenchman Flat and Rainier Mesa. As time and opportunity was available, we marked 45 and recaptured 17; 9 once, 5 three, and 3 four times. No attempt was made to determine home range size, although our records indicate that certain rocks with suitable cracks and holes served as a home base around which they foraged and sunned.

As we continued to mark and recapture, we noted considerable growth in both size (mm) and weight (grams). Three males provided the following data: Number 2 on 30 June 1965 had S-V 175 mm and weighed 238 grams. On 29 June 1966 S-V 250 and weighed 315 grams. On 4 May 1968 only 2 mm of additional growth had occurred, but he had gained 80 additional grams to weigh 395 grams.

Number 4 on 16 July 1965 had a S-V of 150 and weighed 159 grams. On 28 May 1966 the S-V was 173 and weighed 210 grams. On 11 June 1968 he was S-V 185 and weighed 287 grams.

Number 6 on 21 July 1965 was S-V 154 and weighed 146 grams. On 28 June 1967 number 6 (two years' growth) was S-V 181 and weighed 251. This individual had averaged over 50 grams per year, but only 27 mm in S-V length.

We noted that the greatest growth of those marked occurred in the first three years; this is particularly true for the S-V length. After three years, most growth was in terms of added weight. Males were larger than females. The largest male (number 7) seen weighed 432 grams and was at least five

years old. This individual gained only 39 grams in 3 years (393 grams on 28 May 1966 to 432 grams on 13 June 1968). Our data indicate that, after the S-V length of 200 mm is reached, a considerable slowing in length growth occurs; but, as noted above, increase in weight continues.

We noted courtships in May and early June, and that females were gravid in July. Three clutches of eggs were laid in July, and ranged in number from 4 to 14.

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